TABLES

TABLE 1

SUMMARY OF RISK-BASED SCREENING LEVELS[1] FOR CHEMICALS OF POTENTIAL CONCERN IN SOIL

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Compound	RBSL in milligrams per kilogram (mg/kg)			
	Construction Worker		Outdoor Commercial/Industrial Worker	
	Cancer	Noncancer	Cancer	Noncancer
Polychlorinated Biphenyls (PCBs)				
Aroclor-1232	3.5E+00	--	5.3E-01	--
Aroclor-1248	3.5E+00	--	5.3E-01	--
Aroclor-1254	3.5E+00	2.0E+00	5.3E-01	7.5E+00
Aroclor-1260	3.5E+00	--	5.3E-01	--
Metals				
Arsenic	7.1E+00	1.6E+01	1.3E+00	2.1E+02
Barium	NC	7.2E+02	NC	1.6E+05
Cadmium	2.4E+01	2.5E+01	1.8E+03	5.0E+02
Chromium (total)	8.5E+00	3.9E+05	6.4E+02	1.4E+06
Cobalt	1.1E+01	7.9E+00	8.5E+02	2.7E+02
Copper	NC	1.0E+04	NC	3.7E+04
Lead[2]	9.4E+02		3.2E+02	
Mercury	--	2.1E+01	--	1.4E+02
Molybdenum	--	1.3E+03	--	4.6E+03
Nickel	3.9E+02	7.2E+01	3.0E+04	1.8E+04
Silver	NC	1.3E+03	NC	4.6E+03
Thallium	--	1.7E+01	--	6.0E+01
Vanadium	--	1.8E+03	--	6.4E+03
Zinc	NC	7.8E+04	NC	2.8E+05
Total Petroleum Hydrocarbons (TPH)[3] - Apportion Method RBSLs				
TPH as gasoline	--	6.9E+03	--	2.5E+04
TPH as diesel	--	6.1E+04	--	2.7E+05
TPH as motor oil	--	2.0E+05	--	7.2E+05
TPH as Stoddard solvent	--	9.0E+03	--	3.3E+04
TEPH	--	8.7E+04	--	4.2E+05
c6-c10 hydrocarbons	--	6.9E+03	--	2.5E+04
c10-c20 hydrocarbons	--	3.4E+04	--	1.4E+05
c10-c28 hydrocarbons	--	7.3E+04	--	3.4E+05
c21-c28 hydrocarbons	--	1.7E+05	--	6.3E+05
Total Petroleum Hydrocarbons (TPH)[3] - Worst Case RBSLs				
TPH as gasoline	--	2.9E+03	--	1.1E+04
TPH as diesel	--	6.6E+03	--	2.5E+04
TPH as motor oil	--	1.3E+05	--	4.9E+05
TPH as Stoddard solvent	--	2.9E+03	--	1.1E+04
TEPH	--	6.6E+03	--	2.5E+04
c6-c10 hydrocarbons	--	2.9E+03	--	1.1E+04
c10-c20 hydrocarbons	--	6.6E+03	--	2.5E+04
c10-c28 hydrocarbons	--	6.6E+03	--	2.5E+04
c21-c28 hydrocarbons	--	1.3E+05	--	4.9E+05

TABLE 1

SUMMARY OF RISK-BASED SCREENING LEVELS[1] FOR CHEMICALS OF POTENTIAL CONCERN IN SOIL

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Compound	RBSL in milligrams per kilogram (mg/kg)			
	Construction Worker		Outdoor Commercial/Industrial Worker	
	Cancer	Noncancer	Cancer	Noncancer
Volatile Organic Compounds (VOCs) [3]				
Acetone	--	1.2E+05	--	4.3E+05
Benzene	9.1E+01	5.2E+02	1.3E+01	1.9E+03
n-Butylbenzene	--	5.2E+03	--	1.9E+04
sec-Butylbenzene	--	5.2E+03	--	1.9E+04
Ethylbenzene	8.3E+02	1.3E+04	1.2E+02	4.8E+04
Isopropylbenzene	NC	1.3E+04	NC	4.8E+04
Isopropyltoluene	NC	1.3E+04	NC	4.8E+04
Naphthalene	--	2.6E+03	--	9.6E+03
n-Propylbenzene	--	5.2E+03	--	1.9E+04
Tetrachloroethene (PCE)	1.7E+01	1.3E+03	2.5E+00	4.8E+03
Toluene	--	1.0E+04	--	3.8E+04
Trichloroethene (TCE)	1.5E+03	3.9E+01	2.3E+02	1.4E+02
1,2,4-Trimethylbenzene	--	6.5E+03	--	2.4E+04
1,3,5-Trimethylbenzene	--	6.5E+03	--	2.4E+04
Total Xylenes	--	2.6E+04	--	9.6E+04
m/p-Xylenes	--	2.6E+04	--	9.6E+04
o-Xylene	--	2.6E+04	--	9.6E+04

Notes:

1. Calculation of risk-based screening levels (RBSLs) presented in Appendix C.
2. RBSLs developed for lead based on blood-lead levels, not probability of increased cancer risk or noncancer hazard quotient.
3. Inhalation pathways not incorporated into the development of RBSLs for volatile total petroleum hydrocarbon (TPH) mixtures and volatile organic compounds (VOC). Volatilization of chemicals from the subsurface to ambient or indoor air evaluated using soil vapor measurements and RBSLs developed for this data (Table 3).

Abbreviations:

NC = noncarcinogenic
RBSL = risk-based screening level
-- = not applicable

TABLE 2

SUMMARY OF RISK-BASED SCREENING LEVELS[1] FOR CHEMICALS OF POTENTIAL CONCERN IN GROUNDWATER

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Compound	RBSL in micrograms per liter (µg/L)	
	Indoor Commercial/Industrial Worker - Exposure to Indoor Air	
	Cancer	Noncancer
Total Petroleum Hydrocarbons (TPH) - Apportion Method RBSLs		
TPH as Stoddard solvent	--	1.0E+03
Total Petroleum Hydrocarbons (TPH) - Worst Case RBSLs		
TPH as Stoddard solvent	--	6.8E+02
Volatile Organic Compounds (VOCs)		
Benzene	2.1E+01	1.3E+04
Chloroform	1.4E+02	8.2E+04
1,1-Dichloroethene	--	3.0E+03
1,2-Dichloroethane	1.4E+02	--
Dichloromethane	1.3E+03	1.9E+05
Ethylbenzene	2.0E+02	3.7E+05
Tetrachloroethene (PCE)	3.8E+01	2.8E+03
Toluene	--	5.5E+04
Trichloroethene (TCE)	1.8E+02	7.8E+04
m/p-Xylenes	--	1.3E+05
o-Xylene	--	1.7E+05

Notes:

1. Calculation of risk-based screening levels presented in Appendix C.

Abbreviations:

CAS No. = chemical abstract service number
NC = noncarcinogenic
RBSL = risk-based screening level
-- = not applicable

TABLE 3

SUMMARY OF RISK-BASED SCREENING LEVELS[1] FOR CHEMICALS OF POTENTIAL CONCERN IN SOIL VAPOR

Former Pechiney Cast Plate, Inc. Facility

Vernon, California

Compound	RBSL in micrograms per liter (µg/L)					
	Construction Worker - Exposure to Ambient Air		Outdoor Commercial/Industrial Worker - Exposure to Ambient Air		Indoor Commercial/Industrial Worker - Exposure to Indoor Air	
	Cancer	Noncancer	Cancer	Noncancer	Cancer	Noncancer
Total Petroleum Hydrocarbons (TPH) - Apportion Method RBSLs						
TPH as Stoddard solvent	--	1.0E+05	--	6.9E+05	--	1.5E+03
Total Petroleum Hydrocarbons (TPH) - Worst Case RBSLs						
TPH as Stoddard solvent	--	1.7E+04	--	1.2E+05	--	6.8E+02
Volatile Organic Compounds (VOCs)						
Chloroform	3.4E+03	7.9E+04	9.8E+02	5.7E+05	2.0E+00	1.1E+03
1,2-Dichloroethane	6.4E+02	4.5E+05	1.8E+02	3.2E+06	5.2E-01	9.1E+03
1,1-Dichloroethene	--	3.3E+04	--	2.4E+05	--	2.9E+02
cis-1,2-Dichloroethene	NC	1.2E+04	NC	8.5E+04	NC	1.6E+02
Naphthalene	4.9E+01	2.1E+02	1.4E+01	1.5E+03	4.4E-01	4.9E+01
Tetrachloroethene (PCE)	4.5E+03	1.3E+04	1.3E+03	9.6E+04	2.2E+00	1.7E+02
Toluene	--	6.6E+04	--	4.7E+05	--	1.3E+03
1,1,1-Trichloroethane	NC	2.0E+06	NC	1.4E+07	NC	2.3E+04
Trichloroethene (TCE)	1.0E+04	1.7E+05	2.9E+03	1.2E+06	6.3E+00	2.7E+03
1,2,4-Trimethylbenzene	--	7.1E+02	--	5.1E+03	--	3.7E+01
1,3,5-Trimethylbenzene	--	6.0E+02	--	4.3E+03	--	3.2E+01
m/p-Xylenes	--	1.3E+05	--	9.0E+05	--	3.2E+03
o-Xylene	--	1.0E+05	--	7.2E+05	--	3.0E+03

Notes:

1. Calculation of risk-based screening levels presented in Appendix C.

Abbreviations:

CAS No. = chemical abstract service number
NC = noncarcinogenic
RBSL = risk-based screening level
-- = not applicable

TABLE 4

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE I AREA

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
		Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
Aroclor-1248	29	5.3E-01	--	**5.5E-05**	--	3.5E+00	--	**8.4E-06**	--
Aroclor-1260	13	5.3E-01	--	**2.5E-05**	--	3.5E+00	--	**3.8E-06**	--
Cadmium	1.4	1.8E+03	5.0E+02	7.8E-10	2.8E-03	2.4E+01	2.5E+01	5.9E-08	5.7E-02
Copper	75	NC	3.7E+04	--	2.0E-03	NC	1.0E+04	--	7.3E-03
Mercury	0.23	--	1.4E+02	--	1.6E-03	--	2.1E+01	--	1.1E-02
Zinc	430	NC	2.8E+05	--	1.6E-03	NC	7.8E+04	--	5.5E-03
TPH as diesel	107	--	2.7E+05	--	3.9E-04	--	6.1E+04	--	1.8E-03
TPH as motor oil	464	--	7.2E+05	--	6.4E-04	--	2.0E+05	--	2.4E-03
Ethylbenzene	0.0045	1.2E+02	4.8E+04	3.7E-11	9.4E-08	8.3E+02	1.3E+04	5.4E-12	3.5E-07
Tetrachloroethene (PCE)	0.0084	2.5E+00	4.8E+03	3.4E-09	1.8E-06	1.7E+01	1.3E+03	5.0E-10	6.5E-06
Toluene	0.0085	--	3.8E+04	--	2.2E-07	--	1.0E+04	--	8.2E-07
Trichloroethene (TCE)	0.12	2.3E+02	1.4E+02	5.3E-10	8.4E-04	1.5E+03	3.9E+01	7.8E-11	3.1E-03
m/p-Xylenes	0.0225	--	9.6E+04	--	2.4E-07	--	2.6E+04	--	8.7E-07
Cumulative Risk/Hazard Index				8E-05	0.01			1E-05	0.09
TPH - Worst Case Calculations									
TPH as diesel	107	--	2.5E+04	--	4.3E-03	--	6.6E+03	--	1.6E-02
TPH as motor oil	464	--	4.9E+05	--	9.5E-04	--	1.3E+05	--	3.5E-03

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for either receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 5

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE II AREA

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
		Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
Aroclor-1248	960	5.3E-01	--	**1.8E-03**	--	3.5E+00	--	**2.8E-04**	--
Aroclor-1260	0.3	5.3E-01	--	5.7E-07	--	3.5E+00	--	8.7E-08	--
Chromium (total)	32.1	6.4E+02	1.4E+06	5.0E-08	2.3E-05	8.5E+00	3.9E+05	**3.8E-06**	8.3E-05
Copper	193	NC	3.7E+04	--	5.3E-03	NC	1.0E+04	--	1.9E-02
Zinc	607	NC	2.8E+05	--	2.2E-03	NC	7.8E+04	--	7.8E-03
TPH as diesel	401.1	--	2.7E+05	--	1.5E-03	--	6.1E+04	--	6.6E-03
TPH as motor oil	1,216.4	--	7.2E+05	--	1.7E-03	--	2.0E+05	--	6.2E-03
TEPH	1,100	--	4.2E+05	--	2.6E-03	--	8.7E+04	--	1.3E-02
Toluene	0.0021	--	3.8E+04	--	5.5E-08	--	1.0E+04	--	2.0E-07
Total Xylenes	0.006	--	9.6E+04	--	6.3E-08	--	2.6E+04	--	2.3E-07
Cumulative Risk/Hazard Index				2E-03	0.01			3E-04	0.05
TPH - Worst Case Calculations									
TPH as diesel	401.1	--	2.5E+04	--	1.6E-02	--	6.6E+03	--	6.1E-02
TPH as motor oil	1,216.4	--	4.9E+05	--	2.5E-03	--	1.3E+05	--	9.2E-03
TEPH	1,100	--	2.5E+04	--	4.4E-02	--	6.6E+03	--	1.7E-01

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for either receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 6

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS --
PHASE IIIa AREA
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
		Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
Aroclor-1248	7.1	5.3E-01	--	**1.3E-05**	--	3.5E+00	--	**2.1E-06**	--
Aroclor-1254	5.2	5.3E-01	7.5E+00	**9.8E-06**	6.9E-01	3.5E+00	2.0E+00	**1.5E-06**	**2.6E+00**
Aroclor-1260	0.1	5.3E-01	--	1.9E-07	--	3.5E+00	--	2.9E-08	--
Arsenic	60	1.3E+00	2.1E+02	**4.6E-05**	2.9E-01	7.1E+00	1.6E+01	**8.5E-06**	**3.7E+00**
Copper	257	NC	3.7E+04	--	7.0E-03	NC	1.0E+04	--	2.5E-02
Mercury	0.43	--	1.4E+02	--	3.0E-03	--	2.1E+01	--	2.1E-02
Molybdenum	5	--	4.6E+03	--	1.1E-03	--	1.3E+03	--	3.9E-03
Silver	5	NC	4.6E+03	--	1.1E-03	NC	1.3E+03	--	3.9E-03
Zinc	187	NC	2.8E+05	--	6.8E-04	NC	7.8E+04	--	2.4E-03
TPH as diesel	30	--	2.7E+05	--	1.1E-04	--	6.1E+04	--	5.0E-04
TPH as motor oil	182	--	7.2E+05	--	2.5E-04	--	2.0E+05	--	9.3E-04
c10-c20 hydrocarbons	7,000	--	1.4E+05	--	5.1E-02	--	3.4E+04	--	2.1E-01
c10-c28 hydrocarbons	280	--	3.4E+05	--	8.1E-04	--	7.3E+04	--	3.8E-03
c21-c28 hydrocarbons	42,000	--	6.3E+05	--	6.7E-02	--	1.7E+05	--	2.5E-01
Cumulative Risk/Hazard Index				7E-05	1			1E-05	6
TPH - Worst Case Calculations									
TPH as diesel	30	--	2.5E+04	--	1.2E-03	--	6.6E+03	--	4.6E-03
TPH as motor oil	182	--	4.9E+05	--	3.7E-04	--	1.3E+05	--	1.4E-03
c10-c20 hydrocarbons	7,000	--	2.5E+04	--	2.8E-01	--	6.6E+03	--	**1.1E+00**
c10-c28 hydrocarbons	280	--	2.5E+04	--	1.1E-02	--	6.6E+03	--	4.3E-02
c21-c28 hydrocarbons	42,000	--	4.9E+05	--	8.6E-02	--	1.3E+05	--	3.2E-01

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for either receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 7

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS --
PHASE IIIb AREA
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
		Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
c6-c10 hydrocarbons	17,000	--	2.5E+04	--	6.7E-01	--	6.9E+03	--	**2.5E+00**
c10-c28 hydrocarbons	13,000	--	3.4E+05	--	3.8E-02	--	7.3E+04	--	1.8E-01
Benzene	3.8	1.3E+01	1.9E+03	2.8E-07	2.0E-03	9.1E+01	5.2E+02	4.2E-08	7.3E-03
Ethylbenzene	7.6	1.2E+02	4.8E+04	6.3E-08	1.6E-04	8.3E+02	1.3E+04	9.2E-09	5.8E-04
Xylenes (total)	62	--	9.6E+04	--	6.5E-04	--	2.6E+04	--	2.4E-03
Cumulative Risk/Hazard Index				3E-07	1			5E-08	3
TPH - Worst Case Calculations									
c6-c10 hydrocarbons	17,000	--	1.1E+04	--	**1.6E+00**	--	2.9E+03	--	**5.9E+00**
c10-c28 hydrocarbons	13,000	--	2.5E+04	--	5.2E-01	--	6.6E+03	--	**2.0E+00**

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for any receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 8

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE IV AREA

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
		Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
Aroclor-1232	0.47	5.3E-01	--	8.9E-07	--	3.5E+00	--	1.4E-07	--
Aroclor-1248	0.25	5.3E-01	--	4.7E-07	--	3.5E+00	--	7.2E-08	--
Aroclor-1260	1.2	5.3E-01	--	**2.3E-06**	--	3.5E+00	--	3.5E-07	--
Arsenic	120	1.3E+00	2.1E+02	**9.2E-05**	5.7E-01	7.1E+00	1.6E+01	**1.7E-05**	**7.5E+00**
Barium	190	NC	1.6E+05	--	1.2E-03	NC	7.2E+02	--	2.6E-01
Cadmium	2.8	1.8E+03	5.0E+02	1.6E-09	5.6E-03	2.4E+01	2.5E+01	1.2E-07	1.1E-01
Cobalt	16	8.5E+02	2.7E+02	1.9E-08	5.9E-02	1.1E+01	7.9E+00	**1.4E-06**	**2.0E+00**
Copper	76	NC	3.7E+04	--	2.1E-03	NC	1.0E+04	--	7.4E-03
Mercury	0.98	--	1.4E+02	--	6.9E-03	--	2.1E+01	--	4.7E-02
Nickel	27	3.0E+04	1.8E+04	9.1E-10	1.5E-03	3.9E+02	7.2E+01	6.9E-08	3.7E-01
Thallium	1.2	--	6.0E+01	--	2.0E-02	--	1.7E+01	--	7.1E-02
Vanadium	59	--	6.4E+03	--	9.2E-03	--	1.8E+03	--	3.3E-02
Zinc	110	NC	2.8E+05	--	4.0E-04	NC	7.8E+04	--	1.4E-03
TPH as gasoline	420	--	2.5E+04	--	1.7E-02	--	6.9E+03	--	6.1E-02
TPH as diesel	365	--	2.7E+05	--	1.3E-03	--	6.1E+04	--	6.0E-03
TPH as motor oil	185	--	7.2E+05	--	2.6E-04	--	2.0E+05	--	9.4E-04
TPH as Stoddard solvent	890	--	3.3E+04	--	2.7E-02	--	9.0E+03	--	9.9E-02
c6-c10 hydrocarbons	26,000	--	2.5E+04	--	1.0E+00	--	6.9E+03	--	**3.8E+00**
c10-c20 hydrocarbons	37,000	--	1.4E+05	--	2.7E-01	--	3.4E+04	--	**1.1E+00**
c10-c28 hydrocarbons	9,200	--	3.4E+05	--	2.7E-02	--	7.3E+04	--	1.3E-01
c21-c28 hydrocarbons	160	--	6.3E+05	--	2.6E-04	--	1.7E+05	--	9.4E-04
Acetone	0.085	--	4.3E+05	--	2.0E-07	--	1.2E+05	--	7.3E-07
Benzene	3.1	1.3E+01	1.9E+03	2.3E-07	1.6E-03	9.1E+01	5.2E+02	3.4E-08	6.0E-03
n-Butylbenzene	28	--	1.9E+04	--	1.5E-03	--	5.2E+03	--	5.4E-03
sec-Butylbenzene	15	--	1.9E+04	--	7.9E-04	--	5.2E+03	--	2.9E-03
Ethylbenzene	31	1.2E+02	4.8E+04	2.6E-07	6.5E-04	8.3E+02	1.3E+04	3.7E-08	2.4E-03
Isopropylbenzene	0.85	NC	4.8E+04	--	1.8E-05	NC	1.3E+04	--	6.5E-05
Isopropyltoluene	32	NC	4.8E+04	--	6.7E-04	NC	1.3E+04	--	2.5E-03
Naphthalene	5.4	--	9.6E+03	--	5.7E-04	--	2.6E+03	--	2.1E-03
n-Propylbenzene	6.2	--	1.9E+04	--	3.2E-04	--	5.2E+03	--	1.2E-03
Toluene	10	--	3.8E+04	--	2.6E-04	--	1.0E+04	--	9.6E-04
1,2,4-Trimethylbenzene	100	--	2.4E+04	--	4.2E-03	--	6.5E+03	--	1.5E-02
1,3,5-Trimethylbenzene	30	--	2.4E+04	--	1.3E-03	--	6.5E+03	--	4.6E-03
Xylenes (total)	160	--	9.6E+04	--	1.7E-03	--	2.6E+04	--	6.2E-03
Cumulative Risk/Hazard Index				1E-04	2			2E-05	16

TABLE 8

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE IV AREA

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
		Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
TPH - Worst Case Calculations									
TPH as gasoline	420	--	1.1E+04	--	4.0E-02	--	2.9E+03	--	1.5E-01
TPH as diesel	365	--	2.5E+04	--	1.5E-02	--	6.6E+03	--	5.5E-02
TPH as motor oil	185	--	4.9E+05	--	3.8E-04	--	1.3E+05	--	1.4E-03
TPH as Stoddard solvent	890	--	1.1E+04	--	8.5E-02	--	2.9E+03	--	3.1E-01
c6-c10 hydrocarbons	26,000	--	1.1E+04	--	**2.5E+00**	--	2.9E+03	--	**9.1E+00**
c10-c20 hydrocarbons	37,000	--	2.5E+04	--	**1.5E+00**	--	6.6E+03	--	**5.6E+00**
c10-c28 hydrocarbons	9,200	--	2.5E+04	--	3.7E-01	--	6.6E+03	--	**1.4E+00**
c21-c28 hydrocarbons	160	--	4.9E+05	--	3.3E-04	--	1.3E+05	--	1.2E-03

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for any receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 9

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE V AREA

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
		Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
Cadmium	0.54	1.8E+03	5.0E+02	3.0E-10	1.1E-03	2.4E+01	2.5E+01	2.3E-08	2.2E-02
Zinc	138	NC	2.8E+05	--	5.0E-04	NC	7.8E+04	--	1.8E-03
c10-c28 hydrocarbons	540	--	3.4E+05	--	1.6E-03	--	7.3E+04	--	7.4E-03
Cumulative Risk/Hazard Index				3E-10	0.003			2E-08	0.03
TPH - Worst Case Calculations									
c10-c28 hydrocarbons	540	--	2.5E+04	--	2.2E-02	--	6.6E+03	--	8.2E-02

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for any receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 10

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE VI AREA

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
		Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
Aroclor-1248	0.14	5.3E-01	--	2.7E-07	--	3.5E+00	--	4.0E-08	--
Aroclor-1260	0.57	5.3E-01	--	**1.1E-06**	--	3.5E+00	--	1.6E-07	--
Arsenic	74	1.3E+00	2.1E+02	**5.7E-05**	3.5E-01	7.1E+00	1.6E+01	**1.0E-05**	**4.6E+00**
Mercury	0.4	--	1.4E+02	--	2.8E-03	--	2.1E+01	--	1.9E-02
Nickel	24.5	3.0E+04	1.8E+04	8.3E-10	1.4E-03	3.9E+02	7.2E+01	6.2E-08	3.4E-01
Zinc	145	NC	2.8E+05	--	5.3E-04	NC	7.8E+04	--	1.9E-03
c10-c28 hydrocarbons	280	--	3.4E+05	--	8.1E-04	--	7.3E+04	--	3.8E-03
Cumulative Risk/Hazard Index				6E-05	0.4			1E-05	5
TPH - Worst Case Calculations									
c10-c28 hydrocarbons	280	--	2.5E+04	--	1.1E-02	--	6.6E+03	--	4.3E-02

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for either receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 11

SUMMARY OF MAXIMUM PREDICTED LIFETIME EXCESS CANCER RISKS AND NONCANCER HAZARD INDEXES -- SOIL EXPOSURE

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Area	Cancer Risks		Noncancer HIs	
	Outdoor Commercial/Industrial Worker	Construction Worker	Outdoor Commercial/Industrial Worker	Construction Worker
Phase I	8E-05	1E-05	0.01	0.09
Phase II	2E-03	3E-04	0.01	0.05
Phase IIIa	7E-05	1E-05	1	6
Phase IIIb	3E-07	5E-08	0.7	3
Phase IV	1E-04	2E-05	2	16
Phase V	3E-10	2E-08	0.003	0.03
Phase VI	6E-05	1E-05	0.4	5

Abbreviations:
HI = hazard index

TABLE 12

COMPARISON OF MAXIMUM GROUNDWATER CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- SITE-WIDE

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (µg/L)	Groundwater RBSL -- Indoor Commercial/Industrial Worker		Predicted Risks	
		Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient
Benzene	2.8	2.1E+01	1.3E+04	1.4E-07	2.2E-04
Chloroform	105	1.4E+02	8.2E+04	7.3E-07	1.3E-03
1,1-Dichloroethene	1.2	--	3.0E+03	--	4.0E-04
1,2-Dichloroethane	410	1.4E+02	--	**3.0E-06**	--
Dichloromethane	10	1.3E+03	1.9E+05	7.7E-09	5.4E-05
Ethylbenzene	0.85	2.0E+02	3.7E+05	4.2E-09	2.3E-06
Tetrachloroethene (PCE)	4.6	3.8E+01	2.8E+03	1.2E-07	1.6E-03
Toluene	2.9	--	5.5E+04	--	5.2E-05
TPH as Stoddard solvent	440	--	1.0E+03	--	4.2E-01
Trichloroethene (TCE)	420	1.8E+02	7.8E+04	**2.3E-06**	5.4E-03
m/p-Xylenes	3.9	--	1.3E+05	--	3.0E-05
o-Xylene	2	--	1.7E+05	--	1.2E-05
Cumulative Risk/Hazard Index				6E-06	0.4
TPH - Worst Case Calculations					
TPH as Stoddard solvent	440	--	6.8E+02	--	6.5E-01

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for any receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
µg/L = micrograms per liter
RBSL = risk-based screening level
-- = not applicable

TABLE 13

COMPARISON OF MAXIMUM SOIL VAPOR CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE I AREA

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (µg/L)	Soil Vapor RBSL -- Indoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Construction Worker		Predicted Risks	
		Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient
Chloroform	2.5	2.0E+00	1.1E+03	**1.3E-06**	2.2E-03	9.8E+02	5.7E+05	2.6E-09	4.4E-06	3.4E+03	7.9E+04	7.3E-10	3.1E-05
1,1-Dichloroethylene	22	--	2.9E+02	--	7.6E-02	--	2.4E+05	--	9.2E-05	--	3.3E+04	--	6.6E-04
Tetrachloroethylene (PCE)	120	2.2E+00	1.7E+02	**5.4E-05**	7.2E-01	1.3E+03	9.6E+04	9.4E-08	1.3E-03	4.5E+03	1.3E+04	2.7E-08	8.9E-03
Toluene	4.7	--	1.3E+03	--	3.7E-03	--	4.7E+05	--	1.0E-05	--	6.6E+04	--	7.2E-05
TPH as Stoddard solvent	18	--	1.5E+03	--	1.2E-02	--	6.9E+05	--	2.6E-05	--	1.0E+05	--	1.8E-04
1,1,1-Trichloroethane	13	NC	2.3E+04	--	5.8E-04	NC	1.4E+07	--	9.1E-07	NC	2.0E+06	--	6.5E-06
Trichloroethylene (TCE)	1900	6.3E+00	2.7E+03	**3.0E-04**	7.1E-01	2.9E+03	1.2E+06	6.6E-07	1.5E-03	1.0E+04	1.7E+05	1.9E-07	1.1E-02
m,p-Xylenes	2	--	3.2E+03	--	6.3E-04	--	9.0E+05	--	2.2E-06	--	1.3E+05	--	1.6E-05
Cumulative Risk/Hazard Index				4E-04	2			8E-07	0.003			2E-07	0.02
TPH - Worst Case Calculations													
TPH as Stoddard solvent	18	--	6.8E+02	--	2.6E-02	--	1.2E+05	--	1.5E-04	--	1.7E+04	--	1.1E-03

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for any receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
µg/L = micrograms per liter
RBSL = risk-based screening level
-- = not applicable

TABLE 14

COMPARISON OF MAXIMUM SOIL VAPOR CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE II AREA

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (µg/L)	Soil Vapor RBSL -- Indoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Construction Worker		Predicted Risks	
		Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient
Tetrachloroethylene (PCE)	0.53	2.2E+00	1.7E+02	2.4E-07	3.2E-03	1.3E+03	9.6E+04	4.1E-10	5.5E-06	4.5E+03	1.3E+04	1.2E-10	4.0E-05
Trichloroethylene (TCE)	2.4	6.3E+00	2.7E+03	3.8E-07	8.9E-04	2.9E+03	1.2E+06	8.4E-10	2.0E-06	1.0E+04	1.7E+05	2.4E-10	1.4E-05
Cumulative Risk/Hazard Index				6E-07	0.004			1E-09	7E-06			4E-10	5E-05

Abbreviations:
CAS No. = chemical abstract service number
µg/L = micrograms per liter
RBSL = risk-based screening level

TABLE 15

COMPARISON OF MAXIMUM SOIL VAPOR CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE IIIb AREA

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (µg/L)	Soil Vapor RBSL -- Indoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Construction Worker		Predicted Risks	
		Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient
1,2-Dichloroethane	0.12	5.2E-01	9.1E+03	2.3E-07	1.3E-05	1.8E+02	3.2E+06	6.6E-10	3.7E-08	6.4E+02	4.5E+05	1.9E-10	2.7E-07
Tetrachloroethylene (PCE)	0.15	2.2E+00	1.7E+02	6.8E-08	9.0E-04	1.3E+03	9.6E+04	1.2E-10	1.6E-06	4.5E+03	1.3E+04	3.4E-11	1.1E-05
TPH as Stoddard solvent	60,000	--	1.5E+03	--	**4.0E+01**	--	6.9E+05	--	8.7E-02	--	1.0E+05	--	6.0E-01
1,2,4-Trimethylbenzene	360	--	3.7E+01	--	**9.7E+00**	--	5.1E+03	--	7.1E-02	--	7.1E+02	--	5.1E-01
1,3,5-Trimethylbenzene	120	--	3.2E+01	--	**3.7E+00**	--	4.3E+03	--	2.8E-02	--	6.0E+02	--	2.0E-01
m,p-Xylenes	0.12	--	3.2E+03	--	3.8E-05	--	9.0E+05	--	1.3E-07	--	1.3E+05	--	9.6E-07
Cumulative Risk/Hazard Index				3E-07	53			8E-10	0.2			2E-10	1
TPH - Worst Case Calculations													
TPH as Stoddard solvent	60,000	--	6.8E+02	--	**8.8E+01**	--	1.2E+05	--	4.9E-01	--	1.7E+04	--	**3.5E+00**

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for any receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
µg/L = micrograms per liter
RBSL = risk-based screening level
-- = not applicable

TABLE 16

COMPARISON OF MAXIMUM SOIL VAPOR CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE IV AREA

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (µg/L)	Soil Vapor RBSL -- Indoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Construction Worker		Predicted Risks	
		Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient
Naphthalene	0.083	4.4E-01	4.9E+01	1.9E-07	1.7E-03	1.4E+01	1.5E+03	6.0E-09	5.4E-05	4.9E+01	2.1E+02	1.7E-09	3.9E-04
Tetrachloroethylene (PCE)	0.27	2.2E+00	1.7E+02	1.2E-07	1.6E-03	1.3E+03	9.6E+04	2.1E-10	2.8E-06	4.5E+03	1.3E+04	6.0E-11	2.0E-05
TPH as Stoddard solvent	42,000	--	1.5E+03	--	**2.8E+01**	--	6.9E+05	--	6.1E-02	--	1.0E+05	--	4.2E-01
Trichloroethylene (TCE)	0.19	6.3E+00	2.7E+03	3.0E-08	7.1E-05	2.9E+03	1.2E+06	6.6E-11	1.5E-07	1.0E+04	1.7E+05	1.9E-11	1.1E-06
1,2,4-Trimethylbenzene	280	--	3.7E+01	--	**7.5E+00**	--	5.1E+03	--	5.5E-02	--	7.1E+02	--	4.0E-01
1,3,5-Trimethylbenzene	70	--	3.2E+01	--	**2.2E+00**	--	4.3E+03	--	1.6E-02	--	6.0E+02	--	1.2E-01
m,p-Xylenes	44	--	3.2E+03	--	1.4E-02	--	9.0E+05	--	4.9E-05	--	1.3E+05	--	3.5E-04
o-Xylene	27	--	3.0E+03	--	9.1E-03	--	7.2E+05	--	3.7E-05	--	1.0E+05	--	2.7E-04
Cumulative Risk/Hazard Index				3E-07	38			6E-09	0.1			2E-09	1
TPH - Worst Case Calculations													
TPH as Stoddard solvent	42,000	--	6.8E+02	--	**6.2E+01**	--	1.2E+05	--	3.4E-01	--	1.7E+04	--	**2.5E+00**

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for any receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
µg/L = micrograms per liter
RBSL = risk-based screening level
-- = not applicable

TABLE 17

COMPARISON OF MAXIMUM SOIL VAPOR CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE V AREA

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Chemical	Maximum Concentration (µg/L)	Soil Vapor RBSL -- Indoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Construction Worker		Predicted Risks	
		Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient
Tetrachloroethylene (PCE)	0.22	2.2E+00	1.7E+02	9.9E-08	1.3E-03	1.3E+03	9.6E+04	1.7E-10	2.3E-06	4.5E+03	1.3E+04	4.9E-11	1.6E-05
Toluene	0.51	--	1.3E+03	--	4.0E-04	--	4.7E+05	--	1.1E-06	--	6.6E+04	--	7.8E-06
m,p-Xylenes	0.48	--	3.2E+03	--	1.5E-04	--	9.0E+05	--	5.4E-07	--	1.3E+05	--	3.8E-06
Cumulative Risk/Hazard Index				1E-07	0.002			2E-10	4E-06			5E-11	3E-05

Abbreviations:
CAS No. = chemical abstract service number
µg/L = micrograms per liter
RBSL = risk-based screening level
-- = not applicable

TABLE 18

SUMMARY OF MAXIMUM PREDICTED LIFETIME EXCESS CANCER RISKS AND NONCANCER HAZARD INDEXES -- SOIL VAPOR EXPOSURE

Former Pechiney Cast Plate, Inc. Facility

Vernon, California

Area	Cancer Risks			Noncancer HIs		
	Indoor Commercial/Industrial Worker	Outdoor Commercial/Industrial Worker	Construction Worker	Indoor Commercial/Industrial Worker	Outdoor Commercial/Industrial Worker	Construction Worker
Phase I	4E-04	8E-07	2E-07	2	0.003	0.02
Phase II	6E-07	1E-09	4E-10	0.004	7E-06	5E-05
Phase IIIa	--[1]	--[1]	--[1]	--[1]	--[1]	--[1]
Phase IIIb	3E-07	8E-10	2E-10	53	0.2	1
Phase IV	3E-07	6E-09	2E-09	38	0.1	0.9
Phase V	1E-07	2E-10	5E-11	0.002	4E-06	3E-05
Phase VI	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]

Notes:

1. No volatile organic compounds (VOCs) were detected in soil vapor in the Phase IIIa area.
2. No soil vapor samples collected in the Phase VI area.

Abbreviations:

HI = hazard index
VOC = volatile organic compound
-- = not applicable

TABLE 19

SUMMARY OF MAXIMUM PREDICTED LIFETIME EXCESS CANCER RISKS AND NONCANCER HAZARD INDEXES -- CUMULATIVE SOIL AND SOIL VAPOR EXPOSURE

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Area	Cancer Risks			Noncancer HIs		
	Indoor Commercial/Industrial Worker	Outdoor Commercial/Industrial Worker	Construction Worker	Indoor Commercial/Industrial Worker	Outdoor Commercial/Industrial Worker	Construction Worker
Phase I	**4E-04**	8E-05	1E-05	**2**	0.01	0.1
Phase II	6E-07	**2E-03**	**3E-04**	0.004	0.01	0.05
Phase IIIa	--[1]	7E-05	1E-05	--[1]	1	**6**
Phase IIIb	3E-07	3E-07	5E-08	**53**	1	**4**
Phase IV	3E-07	1E-04	2E-05	**38**	**2**	**17**
Phase V	1E-07	5E-10	2E-08	0.002	0.003	0.03
Phase VI	--[1]	6E-05	1E-05	--[1]	0.4	**5**

Notes:

Cancer risks and HIs above the ranges considered acceptable by regulatory agencies are highlighted in **bold**.

1. No volatile organic compounds were detected in soil or soil vapor in the Phase IIIa and Phase VI areas.

Abbreviations:

HI = hazard index
VOC = volatile organic compound
-- = not applicable

TABLE 20

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- LEAD

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Area	Lead Maximum Concentration (mg/kg)	Outdoor Commercial/Industrial Worker		Construction Worker	
		Screening Level	Risk Ratio[1]	Screening Level	Risk Ratio[1]
Phase I	34 [2]	320	--	940	--
Phase II	82	320	2.6E-01	940	8.7E-02
Phase IIIa	157	320	4.9E-01	940	1.7E-01
Phase IIIb	12 [2]	320	--	940	--
Phase IV	55	320	1.7E-01	940	5.9E-02
Phase V	28.8 [2]	320	--	940	--
Phase VI	23.4 [2]	320	--	940	--

Notes:

1. Ratio of lead concentration to risk-based screening level.
2. Below 48.5 mg/kg, the site-specific background concentration of lead established as described in Appendix B.

Abbreviations:

mg/kg = milligrams per kilogram
NA = not analyzed
-- = not applicable

TABLE 21

SOIL SCREENING LEVELS FOR SELECTED VOCS FOR THE PROTECTION OF GROUNDWATER

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Depth (feet)	Concentration in micrograms per kilogram (ug/kg)[2]													
	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Benzene	Toluene	Ethylbenzene	Xylenes	n-Butyl benzene	sec-Butyl benzene	1,2-Dichloroethane	Isopropyl benzene	Isopropyl toluene	n-Propyl benzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
1	152	764	15	9,058	15,349	97,239	169,622	128,949	1.8	39,451	594,541	169,622	282,856	62,394
10	145	732	15	8,670	14,690	93,069	162,348	123,419	1.7	37,759	569,046	162,348	270,726	59,718
20	138	694	14	8,227	13,940	88,314	154,053	117,113	1.6	35,830	539,969	154,053	256,893	56,667
30	130	655	13	7,769	13,164	83,398	145,478	110,594	1.5	33,836	509,913	145,478	242,593	53,513
40	122	615	12	7,292	12,356	78,278	136,547	103,804	1.4	31,758	478,609	136,547	227,700	50,227
50	114	572	11	6,777	11,484	72,756	126,914	96,482	1.3	29,518	444,847	126,914	211,638	46,684
60	80	404	8	4,790	8,116	51,415	89,688	68,182	0.9	20,860	314,365	89,688	149,561	32,991
70	60	301	6	3,565	6,040	38,267	66,753	50,746	0.7	15,526	233,975	66,753	111,315	24,554
80	52	260	5	3,081	5,220	33,071	57,688	43,855	0.6	13,417	202,202	57,688	96,199	21,220
90	36	183	4	2,164	3,667	23,230	40,521	30,805	0.5	9,425	142,031	40,521	67,572	14,905
100	27	138	3	1,634	2,768	17,538	30,593	23,257	0.5	7,115	107,232	30,593	51,016	11,253
110	12	59	1	702	1,190	7,536	13,146	9,993	0.5	3,057	46,076	13,146	21,921	4,835
120	9	44	1	530	900	5,694	9,819	7,467	0.5	2,312	34,411	9,819	16,370	3,621
130	5	19	1	229	391	2,466	4,159	3,165	0.5	1,004	14,571	4,159	6,930	1,542
140	5	10	1	150	300	1,750	2,144	1,635	0.5	770	7,504	2,144	3,567	807
149	5	5	1	150	300	1,750	260	260	0.5	770	784	260	369	330

1. Calculations based on Appendix A, "Attenuation Factor Method For VOCs" of "Remediation Guidance For Petroleum and VOC Impacted Sites" in Interim Site Assessment & Cleanup Guidebook published by the California Regional Water Quality Control Board, Los Angeles Region. Calculations are presented in Appendix D.
2. In some cases, detection limits were above screening levels.

TABLE 22A

SITE-SPECIFIC REMEDIATION GOALS
VOCs in Soil Vapor
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Compound	Remediation Goal (micrograms per liter; µg/L)	Explanation
Under Future Use as a Power Plant		
No COCs identified.		
Under Alternative Future Commercial/Industrial Use		
Phase I Area		
Chloroform	6.7	Derived from the Cancer-based RBSL[1] for Indoor Commercial/Industrial Workers (2.0 µg/L). A chloroform concentration of 6.7 µg/L is protective of cumulative indoor commercial/industrial worker exposure to the VOC COCs in the Phase I area, based on a target cancer risk of 10^{-5}.
Tetrachloroethylene (PCE)	7.3	Derived from the Cancer-based RBSL for Indoor Commercial/Industrial Workers (2.2 µg/L). A PCE concentration of 7.3 µg/L is protective of cumulative indoor commercial/industrial worker exposure to the VOC COCs in the Phase I area, based on a target cancer risk of 10^{-5}.
Trichloroethylene (TCE)	21	Derived from the Cancer-based RBSL for Indoor Commercial/Industrial Workers (6.3 µg/L). A TCE concentration of 21 µg/L is protective of cumulative indoor commercial/industrial worker exposure to the VOC COCs in the Phase I area, based on a target cancer risk of 10^{-5}.
Phase IIIb and Phase IV Areas		
TPH as Stoddard solvent	500	Derived from the Noncancer-based RBSL for Indoor Commercial/Industrial Workers (1500 µg/L). A Stoddard solvent concentration of 500 µg/L is protective of cumulative indoor commercial/industrial worker exposure to the VOC COCs in the Phase IIIb and Phase IV areas, based on a target hazard index of 1.
1,2,4-Trimethylbenzene	12.3	Derived from the Noncancer-based RBSL for Indoor Commercial/Industrial Workers (37 µg/L). A 1,2,4-trimethylbenzene concentration of 12.3 µg/L is protective of cumulative indoor commercial/industrial worker exposure to the VOC COCs in the Phase IIIb and Phase IV areas, based on a target hazard index of 1.
1,3,5-Trimethylbenzene	10.7	Derived from the Noncancer-based RBSL for Indoor Commercial/Industrial Workers (32 µg/L). A 1,3,5-trimethylbenzene concentration of 10.7 µg/L is protective of cumulative indoor commercial/industrial worker exposure to the VOC COCs in the Phase IIIb and Phase IV areas, based on a target hazard index of 1.

Notes:

1. RBSL - Risk-Based Screening Level. Developed based on the methodology described in Appendix C, RBSLs were used to conduct the screening-level human health risk assessment (Section 4.0).

TABLE 22B

SITE-SPECIFIC REMEDIATION GOALS
PCBs, Metals, and TPH
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Compound	Remediation Goal (milligrams per kilogram; mg/kg)	Explanation
PCBs[1] in Soil		
Aroclor-1254	2.0	Noncarcinogenic RBSL[2] for construction workers. Also protective of commercial/industrial worker exposure.
Total PCBs (Aroclor-1232, Aroclor-1248, Aroclor-1254, and Aroclor-1260) *For soil that may be left exposed at the surface*	5.3	Derived from the carcinogenic RBSL for outdoor commercial/industrial workers (0.53 mg/kg). A total PCB concentration of 5.3 mg/kg is protective of cumulative commercial/industrial worker exposure to PCBs, based on a target cancer risk of 10^{-5}. Also protective of cumulative construction worker exposure to PCBs.
Total PCBs (Aroclor-1232, Aroclor-1248, Aroclor-1254, and Aroclor-1260) *For soil left below pavement or other ground cover that only construction workers may come into contact with during construction*	35	Derived from the carcinogenic RBSL for construction workers (3.5 mg/kg). A total PCB concentration of 35 mg/kg is protective of cumulative construction worker exposure to PCBs, based on a target cancer risk of 10^{-5}.
PCBs in Concrete		
Total PCBs (Aroclor-1232, Aroclor-1248, Aroclor-1254, and Aroclor-1260)	5.3	Derived from the carcinogenic RBSL for outdoor commercial/industrial workers (0.53 mg/kg). A total PCB concentration of 5.3 mg/kg is protective of cumulative commercial/industrial worker exposure to PCBs, based on a target cancer risk of 10^{-5}. Also protective of cumulative construction worker exposure to PCBs. Applying this remediation goal ensures that waste criteria for concrete containing PCBs is also met [i.e., less than 50 mg/kg, as defined in 40 CFR Section 761.61(a)(4)(i)(A)].
Metals in Soil		
Arsenic	10	Site-Specific Background Concentration in Soil, established as described in Appendix B.
TPH[3] in Soil		
c5-c10 hydrocarbons, c6-c10 hydrocarbons, c7-c12 hydrocarbons, and Stoddard solvent	500	Screening Level for the Protection of Groundwater for TPH gasoline range (c4-c12) from the Los Angeles RWQCB Guidebook.[4]
c10-c20 hydrocarbons and c10-c28 hydrocarbons	1,000	Screening Level for the Protection of Groundwater for TPH diesel range (c13-c22) from the Los Angeles RWQCB Guidebook.[4]
c21-c28 hydrocarbons	10,000	Screening Level for the Protection of Groundwater for TPH as residual fuel (c23-c32) from the Los Angeles RWQCB Guidebook.[4]

Notes:
1. PCBs - Polychlorinated Biphenyls.
2. RBSL - Risk-Based Screening Level. Developed based on the methodology described in Appendix C, RBSLs were used to conduct the screening-level human health risk assessment (Section 4.0).
3. TPH - Total Petroleum Hydrocarbons
4. Los Angeles RWQCB Interim Site Assessment and Cleanup Guidebook (RWQCB Guidebook, May 1996, updated May 2004), for petroleum hydrocarbons and aromatic hydrocarbons (benzene, toluene, ethylbenzene, and total xylenes [BTEX] compounds) in soil. The selected screening levels were taken from Table 4-1 assuming distance above groundwater is 20-150 feet.

TABLE 22C

SITE-SPECIFIC REMEDIATION GOALS[1]
VOCs in Soil
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Depth (feet)	Concentration in micrograms per kilogram (µg/kg)						
	Trichloroethene	Tetrachloroethene	Benzene	Toluene	Ethylbenzene	Xylenes	1,2-Dichloroethane
0	152	764	15	9,058	15,349	97,239	1.8
10	145	732	15	8,670	14,690	93,069	1.7
20	138	694	14	8,227	13,940	88,314	1.6
30	130	655	13	7,769	13,164	83,398	1.5
40	122	615	12	7,292	12,356	78,278	1.4
50	114	572	11	6,777	11,484	72,756	1.3
60	80	404	8	4,790	8,116	51,415	0.9
70	60	301	6	3,565	6,040	38,267	0.7
80	52	260	5	3,081	5,220	33,071	0.6
90	36	183	4	2,164	3,667	23,230	0.5
100	27	138	3	1,634	2,768	17,538	0.5
110	12	59	1	702	1,190	7,536	0.5
120	9	44	1	530	900	5,694	0.5
130	5	19	1	229	391	2,466	0.5
140	5	10	1	150	300	1,750	0.5
149	5	5	1	150	300	1,750	0.5

Notes:

1. Calculations based on Appendix A, "Attenuation Factor Method For VOCs" of "Remediation Guidance For Petroleum and VOC Impacted Sites" in Interim Site Assessment & Cleanup Guidebook published by the California Regional Water Quality Control Board, Los Angeles Region.

TABLE 23
SCREENING OF SOIL TECHNOLOGIES[1,2]
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness[1]	Implementability[1]	Cost[1]	Screening Comments
NO ACTION						
No Action	No further remedial action would take place at the Site. Retained for comparative purposes only.	All Shallow and Deep COC[3]-impacted soils	Poor. Does not meet RAOs[4]. Does not reduce mobility, toxicity, or volume of known wastes.	Good	Low. There are no costs associated with this alternative.	Retained as required by NCP[5] [40 CFR[6] 300.430 (e)(6)].
INSTITUTIONAL CONTROLS						
Institutional controls Examples include: - Deed covenants - Land use covenants - Groundwater use restriction - Zoning	Institutional controls are legal and administrative controls to prevent or control exposure to site occupants if residual contaminants remain on-site. These typically run with the land for perpetuity or as long as residual contamination exists.	All Shallow and Deep COC-impacted soils	Moderate	Moderate	Low	Not retained. Institutional Controls would most likely include either deed or land use covenants, and possibly long-term groundwater monitoring. Property owner input is necessary to make determinations regarding future Site use. Evaluation of groundwater, except for consideration of applying a monitored natural attenuation approach for VOCs,[7] is not included in this FS.[8]
CONTAINMENT						
Capping	Creates a direct contact or migration barrier using a combination of soil/clay/concrete/asphalt/geotextile liners to prevent direct contact with impacted soil or leaching to groundwater by infiltration. May also involve sub-slab venting beneath building foundations. Additional grading to ensure uniform surface for installation may be necessary. Both short-term construction and long-term quality assurance monitoring programs would be necessary. Could require future repairs or modifications to site redevelopment structures if cap was breached.	All Shallow and Deep COC-impacted soils	Good	Poor. Does not meet the RAOs for the site. Does not reduce toxicity or volume through treatment of COCs.	Moderate	Not retained. Future site use not finalized. Any potential future capping requirements would be met by new Site construction slabs and pavements.
Vapor Barrier	Creates a vapor migration barrier using a combination of low permeability materials including synthetic liners to protect from volatile vapor intrusion into buildings or other structures. May also involve passive or active sub-slab venting beneath building foundations. Both short-term construction and long-term quality assurance monitoring programs would be necessary. Requires additional site grading to ensure uniform application. Can be easily breached during any future site redevelopment. Not effective on inorganic or non-volatile organic compounds.	PCB[9]-impacted soils	Poor. Does not meet RAOs. Does not reduce mobility, toxicity, or volume through treatment. Does not reduce the magnitude of residual risk.	Moderate	Moderate. Capitol and annual operations and maintenance costs are required.	Not retained due to low-volatility of PCBs.
		VOC-impacted soils	Good	Moderate	Moderate. Capitol and annual operations and maintenance costs are required.	Not retained for shallow- and deep-impacted soils. Any potential future vapor barrier requirements would be dictated by site reuse. Vapor barrier requirement may be negated by operation of an SVE[10] system.
		Metals-impacted soils	N/A[11]	N/A	N/A	Not applicable due to non-volatility of metals.
		Stoddard solvent-impacted soils	Good	Moderate	Moderate. Capitol and annual operations and maintenance costs are required.	Not retained for shallow- and deep-impacted soils. Any potential future vapor barrier requirements would be dictated by site reuse. Vapor barrier requirement may be negated by operation of an SVE system.

TABLE 23
SCREENING OF SOIL TECHNOLOGIES[1,2]
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness[1]	Implementability[1]	Cost[1]	Screening Comments
EX SITU TREATMENT						
Excavation and Removal	Excavation of impacted soils followed by treatment or disposal; excavated areas restored with clean backfill. May require additional sloping of side walls. Usually requires shoring at depths greater than 10 feet bgs. Excavation depth limited to size of excavator. Deeper excavations may require engineering and special equipment.	All Shallow and Deep COC-impacted soils	Good. Would meet RAOs for Site.	Moderate	Moderate	Retained. Excavation is a presumptive remedy for COC-impacted soil.
Onsite Low Temperature Thermal Desorption	Excavated soil is heated to thermally desorb COCs, which are then treated in the vapor phase. Treated soil can either be used as site backfill or disposed/recycled offsite. Not effective for inorganic compounds. Thermal desorption unit operation requires approximately 1/2 acre of available space for operation, excluding stockpile areas. Requires fuel source (propane or natural gas), installation of electrical power or use of portable electrical generators. Requires AQMD[12] permit and fees to operate, and additional compliance monitoring costs. Excavation, stockpiling, and loading of COC-impacted soil necessary to feed unit. Temperatures typically not high enough to desorb and combust PCBs.	PCB-impacted soils	Poor. Temperatures not high enough to volatilize PCBs. Does not meet RAOs for the site. Does not reduce the toxicity, mobility, or volume through treatment.	Poor. Significant regulatory permitting issues and off-gas collection and treatment issues associated with thermal destruction of PCBs.	Moderate	Not retained.
		VOC-impacted soils	Moderate	Moderate	Moderate	Not retained for deeper VOC-impacted soils due to high relative costs when compared to in situ SVE. Also, not retained due to high permitting and operational costs.
		Metals-impacted soils	N/A	N/A	N/A	Not applicable for metals-impacted soil.
		Stoddard solvent-impacted soils	Good	Good	Moderate	Not retained for deeper Stoddard solvent-impacted soils due to high relative costs when compared to in situ bioventing. Also, not retained due to high permitting and operational costs.

TABLE 23
SCREENING OF SOIL TECHNOLOGIES[1,2]
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness[1]	Implementability[1]	Cost[1]	Screening Comments
Incineration	Incineration uses controlled flame combustion to destroy COCs. Combustion of remaining VOCs and PCBs in secondary combustion chamber. Requires stringent off gas collection and treatment. High temperatures necessary to break down inorganic and non-volatile compounds. Incineration unit operational costs are high. Hazardous residual ash requires landfill disposal. Not feasible to perform on-site due to regulatory permitting requirements. Requires excavation and transportation to out-of-state facilities for incineration.	PCB-impacted soils	Moderate	Poor. Not technically feasible on-site based on regulatory approval challenges. Would require transportation of impacted material to out-of-state facility; implementation would occur off-site.	High. Expensive operations, maintenance and monitoring costs.	Not retained due to high costs.
		VOC-impacted soils	Moderate	Poor. Not technically feasible on-site based on regulatory approval challenges. Would require transportation of impacted material to out-of-state facility; implementation would occur off-site.	High. Expensive operations, maintenance and monitoring costs. Relatively more expensive than SVE technology	Not retained due to high costs.
		Metals-impacted soils	Poor. Does not meet RAOs for the site.	Poor. Not technically feasible on-site based on regulatory approval challenges. Would require transportation of impacted material to out-of-state facility; implementation would occur off-site.	High. Expensive operations, maintenance and monitoring costs.	Not retained due to high costs.
		Stoddard solvent-impacted soils	Moderate	Poor. Not technically feasible on-site based on regulatory approval challenges. Would require transportation of impacted material to out-of-state facility; implementation would occur off-site.	High. Expensive operations, maintenance and monitoring costs. Relatively more expensive than SVE technology	Not retained due to high costs.
Onsite Landfarming/ Bioremediation	Soil is spread in shallow lifts (6-inch to 1-foot thick) and treated by supplying air, moisture and nutrients needed to enhance bioremediation of COCs. Not effective on metals. Requires available space to thinspread soil. May require bottom liner, fugitive dust and emission controls, and run-on and run-off stormwater controls. Requires operations, maintenance, and monitoring.	PCB-impacted soils	Poor. Not a reliable or proven technology for PCBs. Does not meet RAOs for the site. Does not reduce the mobility, toxicity, or volume through treatment.	Moderate. Requires fugitive dust and emission controls, potential AQMD permitting requirements, and stormwater controls.	Moderate	Not retained; PCBs degrade very slowly aerobically and may require specially formulated admixtures to enhance degradation. Also not retained due to additional costs associated with necessary Site controls.
		VOC-impacted soils	Moderate	Moderate. Requires fugitive dust and emission controls, potential AQMD permitting requirements, and stormwater controls.	Moderate	Not retained due to additional costs associated with necessary Site controls.
		Metals-impacted soils	N/A	N/A	N/A	Not applicable; metals not biodegradable.
		Stoddard Solvent-impacted soils	Moderate	Moderate. Requires fugitive dust and emission controls, potential AQMD permitting requirements, and stormwater controls.	Moderate	Not retained due to additional costs associated with necessary Site controls.

TABLE 23
SCREENING OF SOIL TECHNOLOGIES[1,2]
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness[1]	Implementability[1]	Cost[1]	Screening Comments
Offsite Treatment/Disposal - Landfill Disposal - Thermal Desorption - Stabilization	Excavated soil is loaded into trucks or containers for offsite transport for subsequent treatment or disposal. Offsite treatment/disposal includes thermal desorption, stabilization, and/or landfill disposal.	All Shallow and Deep COC-impacted soils	Good. Does meet RAOs for Site. One of the more common remedial technologies that has previously been broadly implemented.	Moderate. Would require off-site shipment of soil for landfill disposal.	Moderate	Retained. Landfill disposal is a commonly used technology for COC-impacted soils.
IN SITU TREATMENT						
Bioremediation	Intrinsic or enhanced bioremediation includes degradation of organic contaminants by naturally occurring microbes in the subsurface; other attenuation processes such as volatilization also occur. Enhanced bioremediation may include the addition of oxygen, biological agents, or nutrients to assist in degrading contaminants in soil. Requires subsurface injection or delivery gallery, and maintenance and monitoring. Requires a well characterized site; implementation requires long-term operations and monitoring. May require multiple applications of nutrients over a long term period necessary for complete remediation of COC-impacted soils. The use of SVE technologies on soils amenable to biodegradation is referred to as "bioventing." Bioventing is an aerobic remediation technology that enhances and accelerates the natural biodegradation process by providing oxygen as a source of electron acceptors to naturally-occurring microorganisms. These microorganisms degrade the fuel hydrocarbon contaminants by using them as a carbon source for cell production, generating carbon dioxide in the process.	PCB-impacted soils	Poor. Not an effectively demonstrated technology for PCBs. Does not meet RAOs for the site. Does not reduce the mobility, toxicity, or volume through treatment.	Poor. Not a broadly implemented technology for PCBs.	Moderate	Not retained; PCBs degrade very slowly and may require specially formulated admixtures to enhance degradation. Also not retained due to nutrient delivery constraints, high maintenance and monitoring costs, and need for multiple applications over a long
		VOC-impacted soils	Moderate. Not as effective as SVE for VOC constituents. Effectiveness limited to success of nutrient delivery system. Requires long-term maintenance and monitoring.	Moderate	Moderate	Not retained due to nutrient delivery constraints, high maintenance and monitoring costs, and need for multiple applications over a long term.
		Metals-impacted soils	N/A	N/A	N/A	Not applicable. Metals are not biodegradable.
		Stoddard solvent-impacted soils	Good. Bioventing has been demonstrated at over 145 US Air Force sites with regulatory acceptance achieved in 38 states (including California) and all 10 EPA regions.	Good. Technology is related to the SVE process although in bioventing oxygen is most commonly supplied through low flow direct injection of atmospheric air into subsurface impacted soil zones. Previous treatability testing performed by Alcoa concluded that environmental conditions (for pH, naturally occurring nutrients, indigenous microbial populations and soil moisture) existed to depths of 45 ft-bgs and would be supportive of in situ soil biodegradation.	Low to Moderate	Bioventing is retained for shallow and deep Stoddard solvent-impacted soils. The US Air Force Center for Environmental Excellence concluded bioventing is a Presumptive Remedy to be applied to remediate fuel-related hydrocarbon contaminated soils at Air Force installations nationwide.

TABLE 23
SCREENING OF SOIL TECHNOLOGIES[1,2]
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness[1]	Implementability[1]	Cost[1]	Screening Comments
Soil Vapor Extraction	Volatile vapors removed from soil with slotted piping and a vacuum blower; extracted vapors treated aboveground with activated carbon or thermal oxidizer. This technology is usually implemented to remove VOCs in shallow or deep soils and is effective in moderate to highly permeable soils. Requires the installation of a soil vapor extraction well network, electrical power, AQMD[12] permit, and operations and maintenance. Not effective on inorganic or non-volatile compounds, Commonly implemented in moderate to large areas of impacted soils.	PCB-impacted soils	Poor. Not an effective technology for PCB-impacted soils. Does not meet RAOs for the site. Does not reduce the mobility, toxicity, or volume through treatment.	Moderate	Moderate	Not retained due to the non-volatility of PCBs.
		VOC-impacted soils	Good	Good	Moderate	Retained for shallow and deep impacted soils. SVE is a presumptive remedy for VOC-impacted soils.
		Metals-impacted soils	N/A	N/A	N/A	Not applicable due to non-volatility of metals.
		Stoddard solvent-impacted soils	Moderate	Good	Moderate	Retained for shallow and deep Stoddard solvent-impacted soils as an effective measure to remove the volatile constituents within Stoddard solvent estimated to comprise approximately 15 percent of the total mass. SVE can be easily converted to bioventing in the later stages of in situ remediation.
In situ Thermal Desorption (Thermal conduction heating)	Heating subsurface soil using thermal wells via resistive heating elements with associated vapor extraction system to remove volatilized contaminants. Soil is heated by thermal conduction, and no current flows through soil. Extracted vapors are treated aboveground with activated carbon or a thermal oxidizer. Demonstrated high costs associated with installation and operation of the thermal heating elements. Requires AQMD permit to operate and long-term operations, maintenance, and permit compliance monitoring.	PCB-impacted soils	Poor. Does not meet RAOs for the site. Does not reduce the mobility, toxicity, or volume through treatment.	Moderate	High	Not retained due to low volatility of PCBs and high costs of implementation and operation of the system.
		VOC-impacted soils	Moderate	Moderate	High	Not retained due to high costs of implementation and operation of the system relative to SVE technologies.
		Metals-impacted soils	N/A	N/A	N/A	Not applicable due to non-volatility of metals.
		Stoddard solvent-impacted soils	Moderate	Moderate	High	Not retained due to high costs of implementation and operation of the system relative to bioventing and SVE technologies.

TABLE 23
SCREENING OF SOIL TECHNOLOGIES[1,2]
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness[1]	Implementability[1]	Cost[1]	Screening Comments
Stabilization	In situ stabilization involves mixing contaminated soils with inorganic binders such as cement or pozzolans to bind or encapsulate soils. Effectiveness diminishes with higher concentration oily wastes. Requires implementation and mobilization of a stabilization material delivery unit. On-site pilot tests are necessary to estimate delivery quantity of stabilization material. Not effective on volatile compounds.	PCB-impacted soils	Good. Previously demonstrated effective on sites with lower	Moderate. Would require bench scale mix design.	Moderate	Retained
		VOC-impacted soils	Poor. Will require collection and treatment of VOC vapors generated during stabilization activities.	Moderate	Moderate	Not retained; poor effectiveness on VOCs. High volatility compounds would generate excessive odors during implementation.
		Metals-impacted soils	Good. Stabilization is a commonly applied technology for metals-impacted soils.	Moderate	Moderate	Retained
		Stoddard solvent-impacted soils	Good.	Moderate. Would require bench scale mix design.	Moderate	Retained

Notes:
1. Definitions of Criteria:
   - Effectiveness is ability of the remedial technology to achieve remedial action objectives;
   - Implementability is a measure of the technical and administrative feasibility of constructing, operating and maintaining a remedial alternative; and,
   - Cost refers to a relative cost compared with other technologies in same technology type. Costs will be refined later in the FS process.
2. Table uses a relative rating scheme: Good, Moderate, Poor for effectiveness and implementability criteria; High, Moderate, and Low for cost criteria.
3. COC - Chemical of Concern.
4. RAOs - Remedial Action Objectives.
5. NCP - National Contingency Plan.
6. CFR - Code of Federal Regulations.
7. VOC - Volatile Organic Compounds.
8. FS - Feasibility Study.
9. PCB - Polychlorinated Biphenyls.
10. SVE - Soil Vapor Extraction.
11. N/A - Not Applicable.
12. AQMD - Air Quality Management District.

TABLE 24

SCREENING OF PCB-IMPACTED CONCRETE TECHNOLOGIES[1,2]

Former Pechiney Cast Plate, Inc. Facility

Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness[1]	Implementability[1]	Cost[1]	Screening Comments
NO ACTION						
No Action	No further remedial action would take place at the site. Retained for comparative purposes only.	PCB[3]-impacted concrete	Poor. Does not meet RAOs.[4] Does not reduce mobility, toxicity, or volume of known wastes.	Good	Low. There are no costs associated with this alternative.	Retained as required by NCP[5] [40 CFR[6] 300.430 (e)(6)].
INSTITUTIONAL CONTROLS						
Institutional controls Examples include: - Deed covenants - Land use covenants - Zoning	Institutional controls are legal and administrative controls to prevent or control exposure to site occupants if residual COCs[7] remain on-site. These typically run with the land for perpetuity or as long as residual contamination exists.	PCB-impacted concrete	Moderate	Moderate	Low	Not retained. Institutional Controls would most likely include either deed or land use covenants. Property owner input is necessary to make determinations regarding future Site use.
EX SITU TREATMENT						
Demolition and Disposal	Demolition of PCB-impacted concrete followed by offsite disposal. Demolition involves the use of heavy equipment. Concrete is sawcut and removed or demolished using a hydraulic breaker. Requires dust and noise controls. Offsite disposal requires sizing.	PCB-impacted concrete	Good. Would meet RAOs.	Good	Moderate	Retained
IN SITU TREATMENT						
Scarification	Impacted concrete is removed in thin layers using a grinder. Creates a fine dusty material. Requires use of heavy equipment with grinder attachments. Dust and noise controls are necessary to protect workplace. Impacted concrete must be well defined in are	PCB-impacted concrete	Poor. Not cost effective on multi-layered surfaces that would require demolition and removal of overlying concrete after scarification of surface, to provide access to lower impacted layers for additional scarification.	Moderate. Impacted concrete dust will require collection and disposal.	Moderate	Not retained due to lack of effectiveness and dust collection issues.

TABLE 24
SCREENING OF PCB-IMPACTED CONCRETE TECHNOLOGIES[1,2]
Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness[1]	Implementability[1]	Cost[1]	Screening Comments
Encapsulation	Encapsulation or sealing of impacted concrete slab areas involves physically microencapsulating wastes by sealing them with an applied compound. Encapsulation is typically performed with polymers, resins or other proprietary binding and sealing compounds.	PCB-impacted concrete	Poor. Surface encapsulation effectiveness is limited to the adhesion between coating and bound wastes. Long-term integrity has not been effectively demonstrated on other sites. Selected bonding agent would need to be resistant to ultraviolet radiation,.	Moderate. Requires the impacted surface to be free of dust or other materials that might affect bonding capability of sealant.	High	Not retained. Encapsulation would require the slab areas to be left in place. This would not allow demolition of existing below grade foundations and footings that are being removed as a component of the Site cleanup. Encapsulation would likely require TSCA[8]-related deed covenants or land use restrictions. Property owner input is necessary to make determinations regarding future Site use.
Steam Cleaning or Pressure Washing	High pressure and/or hot water spray is applied to impacted concrete surfaces to remove contaminants. Not effective on multi-layered surfaces. Does not remove heavily-stained or oil impregnated impacts on porous concrete.	PCB-impacted concrete	Poor. Existing surface slabs were steam cleaned during above grade demolition work associated with building and floor cleaning; subsequent concrete coring indicated PCB-impacts above screening criteria were still present at the surface.	Moderate. Requires collection and disposal of impacted washing rinsate.	High. Not cost effective on multi-layered surfaces that would require demolition and removal of overlying concrete to provide access to lower impacted layers for additional steam cleaning.	Not retained due to lack of effectiveness.

Notes:
1. Definitions of Criteria:
   - Effectiveness is ability of the remedial technology to achieve remedial action objectives;
   - Implementability is a measure of the technical and administrative feasibility of constructing, operating and maintaining a remedial alternative; and,
   - Cost refers to a relative cost compared with other technologies in same technology type. Costs will be refined later in the FS process.
2. Table uses a relative rating scheme: Good, Moderate, Poor for effectiveness and implementability criteria; high, moderate, and low for cost criteria.
3. PCB - Polychlorinated Biphenyls.
4. RAOs - Remedial Action Objectives.
5. NCP - National Contingency Plan.
6. CFR - Code of Federal Regulations.
7. COC - Chemical of Concern
8. TSCA - Toxic Substances Control Act deed covenants [40 CFR 761.61(a)(8)]

TABLE 25

EVALUATION OF REMEDIAL ALTERNATIVES

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Remedial Alternative Description [40 CFR 300.430 (d)(1)][1]	Overall Protection of Human Health and Environment [40 CFR 300.430 (e)(9)(iii)(A)]	Compliance with ARARs[2] [40 CFR 300.430 (e)(9)(iii)(B)]	Long-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(C)]	Reduction of Mobility, Toxicity, and Volume by Treatment [40 CFR 300.430 (e)(9)(iii)(D)]	Short-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(E)]	Implementability [40 CFR 300.430 (e)(9)(iii)(F)]	State Support/Agency Acceptance [40 CFR 300.430 (e)(9)(iii)(H)]	Community Acceptance [40 CFR 300.430 (e)(9)(iii)(I)]	Capital Cost [40 CFR 300.430 (e)(9)(iii)(G)(1)]	O&M[3] Cost for 3 years [40 CFR 300.430 (e)(9)(iii)(G)(2)]	Total Cost NPV[4] 3 years [40 CFR 300.430 (e)(9)(iii)(G)(3)]
Alternative 1: No Action [40 CFR 300.430 (e)(6)]									**$0**	**$0**	**$0**
No further action required.	Would not meet RAOs[5] for the Site.	No activities proposed that would trigger action-specific ARARs.	RAOs not achieved.	Limited reduction in mobility, toxicity, or volume.	RAOs not achieved.	No additional effort required.	Not Acceptable.	Not Acceptable.			
Alternative 2: Excavation and Disposal of All COC[6]-Impacted Soil + Demolition and Disposal of PCB[7]-Impacted Concrete									**$28,700,000**	**$0**	**$28,700,000**
1) Soil Excavation and Off-Site Disposal.	Would meet RAOs of mitigating shallow COC-impacted soils above the risk-based remediation goals summarized in Table 22C. Excavation poses no overall element of risk to human health or the environment.	Would comply with ARARs.	Would prevent potential human exposure by eliminating pathways between future receptors and soil, soil vapor, and airborne dusts. Evaluated using CERCLA[8] guidelines (US EPA, 1988, section 6.2.3.3).[9]	Would reduce the volume of COCs in soil. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Risk to receptors and the environment is low if appropriate PPE[10] is worn by workers and dust, noise and odor controls are implemented. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Technology is reliable and effective. Impacted areas would need to be well defined, but implementation is relatively straightforward using commercially available equipment. Shoring or other stability measures are required. Necessary permits must be obtained. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after FS report has been reviewed by DTSC and US EPA.	Will be evaluated during public participation process.			
2) Concrete Demolition and Off-Site Disposal.	Would meet RAOs to mitigate PCBs above the risk-based remediation goals established for future site use of concrete. These goals are summarized in Table 22B.	Does not comply with impacted concrete reuse requirements proposed by the City of Vernon H&EC.[11]	Would prevent potential human exposure by eliminating pathways between potential receptors and recycled concrete and airborne concrete dust. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce the volume of PCBs in concrete. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Risk to receptors and the environment is low if appropriate PPE is worn by workers and dust, noise and odor controls are implemented. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Impacted areas would need to be well defined, but implementation relatively straightforward using commercially available equipment. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after FS report has been reviewed by DTSC and US EPA.	Will be evaluated during public participation process.			
Alternative 3: Excavation and Disposal of Shallow COC-Impacted Soil + Soil Vapor Extraction for Shallow and Deep VOC-Impacted Soil + SVE and Bioventing for Shallow and Deep Stoddard Solvent-Impacted Soil + Demolition and Disposal of PCB-Impacted Concrete									**$1,400,000**	**$2,100,000**	**$3,500,000**
1) Soil Excavation and Off-Site Disposal.	Would meet RAOs of mitigating shallow COC-impacted soils above the risk-based remediation goals summarized in Table 22C. Excavation poses no overall element of risk to human health or the environment.	Would comply with ARARs.	Would prevent potential human exposure by eliminating pathways between future receptors and soil, soil vapor, and airborne dusts. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce the volume of COCs in soil. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Risk to receptors and the environment is low if appropriate PPE is worn by workers and dust, noise and odor controls are implemented. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Technology is reliable and effective. Impacted areas would need to be well defined, but implementation relatively straightforward using commercially available equipment. Shoring or other stability measures are required. Necessary permits must be obtained. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after FS report has been reviewed by DTSC and US EPA.	Will be evaluated during public participation process.			

TABLE 25

EVALUATION OF REMEDIAL ALTERNATIVES

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Remedial Alternative Description [40 CFR 300.430 (d)(1)][1]	Overall Protection of Human Health and Environment [40 CFR 300.430 (e)(9)(iii)(A)]	Compliance with ARARs[2] [40 CFR 300.430 (e)(9)(iii)(B)]	Long-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(C)]	Reduction of Mobility, Toxicity, and Volume by Treatment [40 CFR 300.430 (e)(9)(iii)(D)]	Short-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(E)]	Implementability [40 CFR 300.430 (e)(9)(iii)(F)]	State Support/Agency Acceptance [40 CFR 300.430 (e)(9)(iii)(H)]	Community Acceptance [40 CFR 300.430 (e)(9)(iii)(I)]	Capital Cost [40 CFR 300.430 (e)(9)(iii)(G)(1)]	O&M[3] Cost for 3 years [40 CFR 300.430 (e)(9)(iii)(G)(2)]	Total Cost NPV[4] 3 years [40 CFR 300.430 (e)(9)(iii)(G)(3)]
2) Soil Vapor Extraction.	Would meet RAOs of mitigating deeper soils impacted with COCs for protection of groundwater and poses no overall element of risk to human health or the environment.	Would comply with ARARs.	SVE is a presumptive remedy and can achieve site-specific remediation goals for VOC-impacted soils. Would prevent potential human exposure by eliminating pathways between future receptors and soil and soil vapors. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce mobility of VOCs in subsurface, and reduce mass of VOCs and Stoddard Solvents in soil. Evaluated using CERCLA guidelines(US EPA, 1988, section 6.2.3.4).	Poses low risk to receptors and the environment if appropriate PPE is worn by workers and noise and odor controls are established during implementation. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Implementation requires well defined impacted areas with an effective monitoring program of the SVE system. Technology is reliable and effective. Necessary permits must be obtained for operation. Evaluated using CERCLA guidelines(US EPA, 1988, section 6.2.3.6).	Will be evaluated after FS report has been reviewed by DTSC and US EPA.	Will be evaluated during public participation process.			
3) Bioventing.	Would meet RAOs of mitigating deeper soils impacted with COCs for protection of groundwater and poses no overall element of risk to human health or the environment.	Would comply with ARARs.	Presumptive remedy that can achieve site-specific remediation goals for Stoddard Solvent-impacted soils. Bioventing would prevent potential human exposure by eliminating pathways between future receptors and soil and soil vapors. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce mobility of Stoddard Solvents in subsurface, and reduce mass of Stoddard Solvents in soil. Evaluated using CERCLA guidelines(US EPA, 1988, section 6.2.3.4).	Poses very low risk to receptors and the environment if appropriate PPE is worn by workers and noise and odor controls are established during implementation. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Implementation requires well defined impacted areas. Technology is reliable and effective with regulatory acceptance in 38 states (including California) and all 10 EPA regions. Evaluated using CERCLA guidelines(US EPA, 1988, section 6.2.3.6).	Will be evaluated after FS report has been reviewed by DTSC and US EPA.	Will be evaluated during public participation process.			
4) Concrete Demolition and Off-Site Disposal.	Would meet RAOs to mitigate PCBs above the risk-based remediation goals established for future site use of concrete. These goals are summarized in Table 22B.	Does not comply with requirements established by the City of Vernon H&EC.	Would prevent potential human exposure by eliminating pathways between potential receptors and recycled concrete and airborne concrete dust. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce the volume of PCBs in concrete. Evaluated using CERCLA guidelines(US EPA, 1988, section 6.2.3.4).	Appropriate PPE would be worn by workers and dust, noise and odor controls would be established during implementation. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Impacted areas would need to be well defined, but implementation relatively straightforward using commercially available equipment. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after draft report has been presented to City of Vernon H & EC.	Will be evaluated during public participation process.			
Alternative 4: In Situ Stabilization of Shallow PCB/Metals-Impacted Soil and Deep Stoddard Solvent-Impacted Soil + Soil Vapor Extraction for Shallow and Deep VOC-Impacted Soil + Demolition and Disposal PCB-Impacted Concrete									**$11,400,000**	**$1,100,000**	**$12,500,000**
1) Soil Stabilization.	Would not meet RAO of mitigating shallow COC-impacted soils above the risk-based remediation goals summarized in Table 15. Poses no overall element of risk to human health or the environment. Would meet RAO of mitigating soils impacted with COCs for protection of	Would comply with requirements established by the City of Vernon H&EC.	Would prevent potential human exposure by eliminating pathways between future receptors and soil, soil vapor, and airborne dusts. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce the mobility and possibly toxicity of COCs in soil. No reduction in volume. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Risk to receptors and the environment is low if appropriate PPE is worn by workers and dust, noise and odor controls are implemented. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Requires a bench-scale test and a well defined impacted area. Implementation relatively straightforward using large diameter auger drilling rig. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after FS report has been reviewed by DTSC and US EPA.	Will be evaluated during public participation process.			

TABLE 25

EVALUATION OF REMEDIAL ALTERNATIVES

Former Pechiney Cast Plate, Inc. Facility
Vernon, California

Remedial Alternative Description [40 CFR 300.430 (d)(1)][1]	Overall Protection of Human Health and Environment [40 CFR 300.430 (e)(9)(iii)(A)]	Compliance with ARARs[2] [40 CFR 300.430 (e)(9)(iii)(B)]	Long-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(C)]	Reduction of Mobility, Toxicity, and Volume by Treatment [40 CFR 300.430 (e)(9)(iii)(D)]	Short-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(E)]	Implementability [40 CFR 300.430 (e)(9)(iii)(F)]	State Support/Agency Acceptance [40 CFR 300.430 (e)(9)(iii)(H)]	Community Acceptance [40 CFR 300.430 (e)(9)(iii)(I)]	Capital Cost [40 CFR 300.430 (e)(9)(iii)(G)(1)]	O&M[3] Cost for 3 years [40 CFR 300.430 (e)(9)(iii)(G)(2)]	Total Cost NPV[4] 3 years [40 CFR 300.430 (e)(9)(iii)(G)(3)]
2) Soil Vapor Extraction.	Would meet RAOs of mitigating deeper soils impacted with COCs for protection of groundwater and poses no overall element of risk to human health or the environment.	Would comply with ARARs.	SVE is a presumptive remedy and can achieve site-specific remediation goals for VOC-impacted soils. Would prevent potential human exposure by eliminating pathways between future receptors and soil and soil vapors. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce mobility of VOCs in subsurface, and reduce mass of VOCs and Stoddard Solvents in soil. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Poses low risk to receptors and the environment if appropriate PPE is worn by workers and noise and odor controls are established during implementation. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Implementation requires well defined impacted areas with an effective monitoring program of the SVE system. Technology is reliable and effective. Necessary permits must be obtained for operation. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after FS report has been reviewed by DTSC and US EPA.	Will be evaluated during public participation process.			
3) Concrete Demolition and Off-Site Disposal.	Would meet RAOs to mitigate PCBs above the risk-based remediation goals established for future site use of concrete. These goals are summarized in Table 22B.	Does not comply with impacted concrete reuse requirements proposed by the City of Vernon H&EC.	Would prevent potential human exposure by eliminating pathways between potential receptors and recycled concrete and airborne concrete dust. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce the volume of PCBs in concrete. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Appropriate PPE would be worn by workers and dust, noise and odor controls would be established during implementation. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Impacted areas would need to be well defined, but implementation relatively straightforward using commercially available equipment. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after FS report has been reviewed by DTSC and US EPA.	Will be evaluated during public participation process.			

Notes:
1. National Contingency Plan Code of Federal Regulations Guidance.
2. Applicable or relevant and appropriate requirements (ARARs).
3. O&M - Operations and Maintenance.
4. NPV - Net Present Value.
5. RAO - Remedial Action Objective.
6. COC - Chemical of Concern.
7. PCB - Polychlorinated Biphenyls
8. CERCLA - Comprehensive Environmental Response, Compensation and Liability Act.
9. United States Environmental Protection Agency (US EPA), Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, 1988.
10. PPE - Personal Protective Equipment.
11. H&EC - Health and Environmental Compliance.